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# TWO NEW SPECIES OF *SLATEROBIUS* HARRINGTON WITH COMMENTS ON THE ECOLOGY AND DISTRIBUTION OF THE GENUS (HEMIPTERA: LYGAEIDAE)

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*Abstract.*—Two new species, **Slaterobius chisos** Slater and Sweet from the southwestern United States and **Slaterobius nigritus** Slater and Brailovsky from Mexico, are described and illustrated as are details of the genitalia. A key to the species of *Slaterobius* is provided. *Slaterobius insignis* is recorded from Mexico and the fifth instar is described and illustrated. *Slaterobius quadristriatus,* previously known only from New Jersey and recorded for the first time from Wisconsin and Michigan, is the only arboreal species of the genus and feeds on pine seeds. The myrmecomorphic nature of the insects is discussed. Based on the known distribution and ecology of the species, a vicariant pattern of speciation is proposed, based on Pleistocene climatic changes.

*Key Words:* Myrmecomorphy, polymorphism, habitat, vicariance, Pleistocene

The genus *Slaterobius* was created by Harrington (1980) to contain two North American species, *S. insignis* (Uhler) and *S. quadristriatus* (Barber), which had previously been placed in the genus *Sphaerobius* Uhler. The type species of the latter, (*Sphaerobius gracilis* Uhler, described from St. Vincent Island in the West Indies) proved not to be congeneric with the North American species (Sweet 1964, Harrington 1980). We have recently had the opportunity to examine specimens from the southwestern United States and Mexico that represent two new species described below. The discovery of these species, together with new information about *S. quadristriatus* (Harrington pers. comm., Wheeler in litt.) allows us to propose a zoogeographical reconstruction of the phyletic history of the genus.

All measurements are in millimeters.

## Key to Species of *Slaterobius*

1. Hemelytra lacking upstanding setae and with four elongate, longitudinal stripes .......... ........................ *quadristriatus* (Barber)
– Hemelytra bearing a series of elongate upstanding setae; and variously colored, never possessing 4 longitudinal pale stripes ........... 2
2. Abdominal sterna 5–7 nearly glabrous, shining, strongly contrasting with a distinct lateral, silvery oblique stripe of pubescence across abdominal sterna 3–5 above stridulitrum ..... ............ *chisos* Slater and Sweet, new species
– Posterior abdominal segments evenly and densely pubescent, as strongly so as on segments 3–5, thus not contrasting in pubescence with stripe of silvery hairs running diagonally anterior to sterna 6 and 7 .................. 3
3. Legs and antennae black; head and pronotum nearly unicolorous dark-chocolate brown ... ...... *nigritus* Slater and Brailovsky, new species

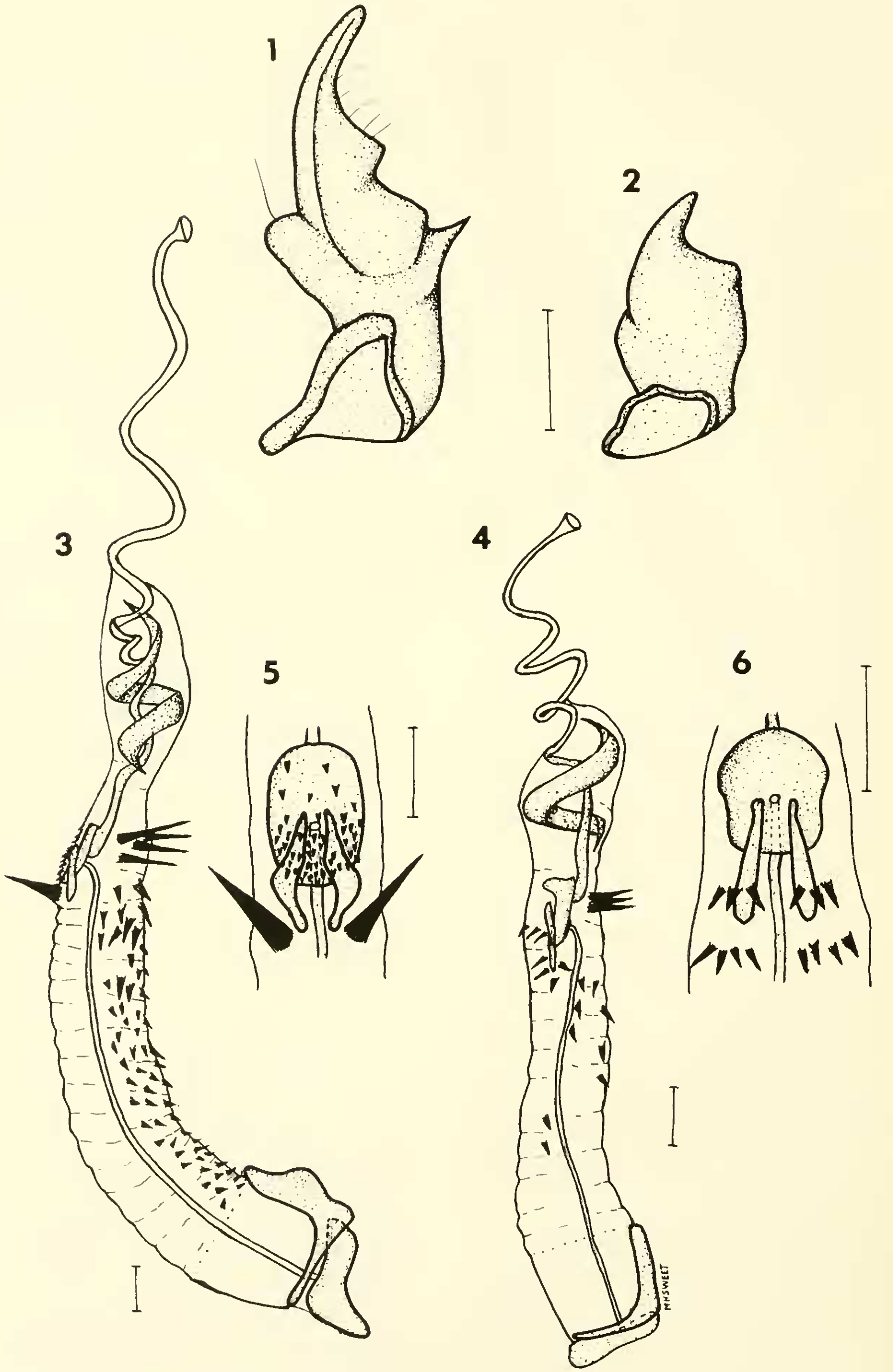
– Legs yellow or pale reddish brown; antennal segments 1, 2, 3 pale, usually pale yellow; pronotum either yellow brown, or if anterior lobe dark-chocolate brown, then strongly contrasting with posterior lobe (rarely unicolorous) . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . *insignis* (Uhler)

### *Slaterobius chisos* Slater and Sweet, New Species
Figs. 2, 4, 6–8

Head, anterior pronotal lobe, basal ¾ of scutellum, and fourth antennal segment chocolate brown. Juga, apex of tylus and submarginal stripe light tan. Anterior pronotal collar, posterior pronotal lobe, basal ½ and subapical macula of hemelytra and first 3 antennal segments pale yellow. A large ovoid darker brown patch covering greater part of distal third of hemelytra and apex of corium, and with directly anterior distinct pale area. Abdomen black distally, reddish brown basally, as is swollen anterior lobe of metapleuron. Legs and antennae sordid yellowish brown. Head and anterior pronotal lobe impunctate, former with surface slightly crazed, latter smooth, both areas polished, contrasting strongly with dull surface of posterior pronotal lobe and hemelytra. A few deep punctures along anterior pronotal collar. Posterior pronotal lobe and hemelytra with scattered large punctures. Scutellum punctate laterad of median elevation. Dorsal surface bearing scattering of very long, upright, brown or black setae. A thick coating of decumbent silvery hairs present on prothorax adjacent to acetabulum, a thick band of silvery hairs covering entire mesopleuron and mesosternum forming a broad strip extending caudomesad on abdominal sternum from anterior margin of sternum 3 to posterior margin of sternum 5; silvery hairs also present on mesal area of sterna 2 and 3. Abdomen otherwise strongly polished and shining. Scutellum dull with a mesal patch of silvery pruinosity near base.

Shape strongly myrmecomorphic. Head moderately declivent, strongly ovoid in lateral view (Fig. 8). Tylus attaining distal end of first antennal segment. Eyes large, oblique, vertex moderately convex. Length head 0.98, width 0.90, interocular space 0.54. Anterior pronotal lobe strongly swollen, convex and globose, strongly elevated above surface of posterior lobe. Lateral pronotal margins deeply incised in area of transverse impression which is complete and deep. Posterior pronotal margin shallowly concave. Length of pronotum 0.84, width across humeri 0.80, length of anterior pronotal lobe 0.58, width across anterior lobe 0.76. Scutellum with a median elevation. Length of scutellum 0.60, width 0.38. Clavus and corium fused, but claval area discernible. Punctures in area of clavus irregular, not forming distinct rows. Lateral hemelytral margins slightly flared laterad ½ way from base, extending posteriorad to middle of abdominal sternum 5; apical margin slightly convex with membrane reduced to a small flange that does not exceed posterolateral angles of corium. Length of claval commissure 0.46. Midline distance from apex of clavus to apex of corium 0.50. Length of hemelytron 1.52. Anterior lobe of metapleuron strongly enlarged, visible from above (Figs. 7, 8). Metathoracic scent gland auricle rounded, not curving posteriorad, evaporative area obsolete. Profemora armed below on inner margin with 2 large and 4–5 small spines. Labium extending posteriorad to between mesocoxae, first segment reaching only to middle of head. Length of labial segments: I 0.46, II 0.52, III 0.40, IV 0.86. Antennae terete, fourth segment narrowly fusiform. Length of antennal segments: I 0.28, II 0.76, III 0.62, IV 0.86. Total body length 4.40.

Clasper (Fig. 2) short, stout with hook small. Aedeagus (Fig. 4) relatively small, gonoporal process of 3 turns with trumpet-like apex; helicoid process of 1¼ turns; no holding sclerites present; ejaculatory reservoir (Fig. 6) with long slender wings; conjunctiva armed with spines as in Figs. 4 and




Figs. 1–6. Male genitalia of *Slaterobius*. Clasper, frontal view. 1, *S. insignis*. 2, *S. chisos*. Aedeagus, lateral view. 3, *S. insignis*. 4, *S. chisos*. Ejaculatory reservoir, ventral view. 5, *S. insignis*. 6, *S. chisos*.

6; phallobase desclerotized, 2 L-shaped dorsal sclerites present. Parandria of genital capsule broadly triangular.

Type specimens.—*Holotype* ♂: TEXAS: Brewster Co., Big Bend National Park, Chisos Mts. Basin, 31.V.1974, M. H. Sweet. In American Museum of Natural History. *Paratypes*: TEXAS: 1 ♀, Brewster Co., Big Bend National Park, Lost Mine Peak, 26.VI.1964, M. H. Sweet. 1 ♂, 1 ♀, Brewster Co., Big Bend National Park, Chisos Mts. Basin, 31.V. 1974, M. H. Sweet. 1 ♂, Terrell Co., 35 mi. NE Sanderson, 18.VI.1979, M. A. Maahs, D. F. Bartell, R. D. Beckham. NEW MEXICO: 1 ♂ (Figs. 7, 8), Santa Fe Co., Los Alamos KLS site, pitfall, 13.V. 1976, F. Miero. In J. A. Slater, M. H. Sweet, and Texas Tech University collections.

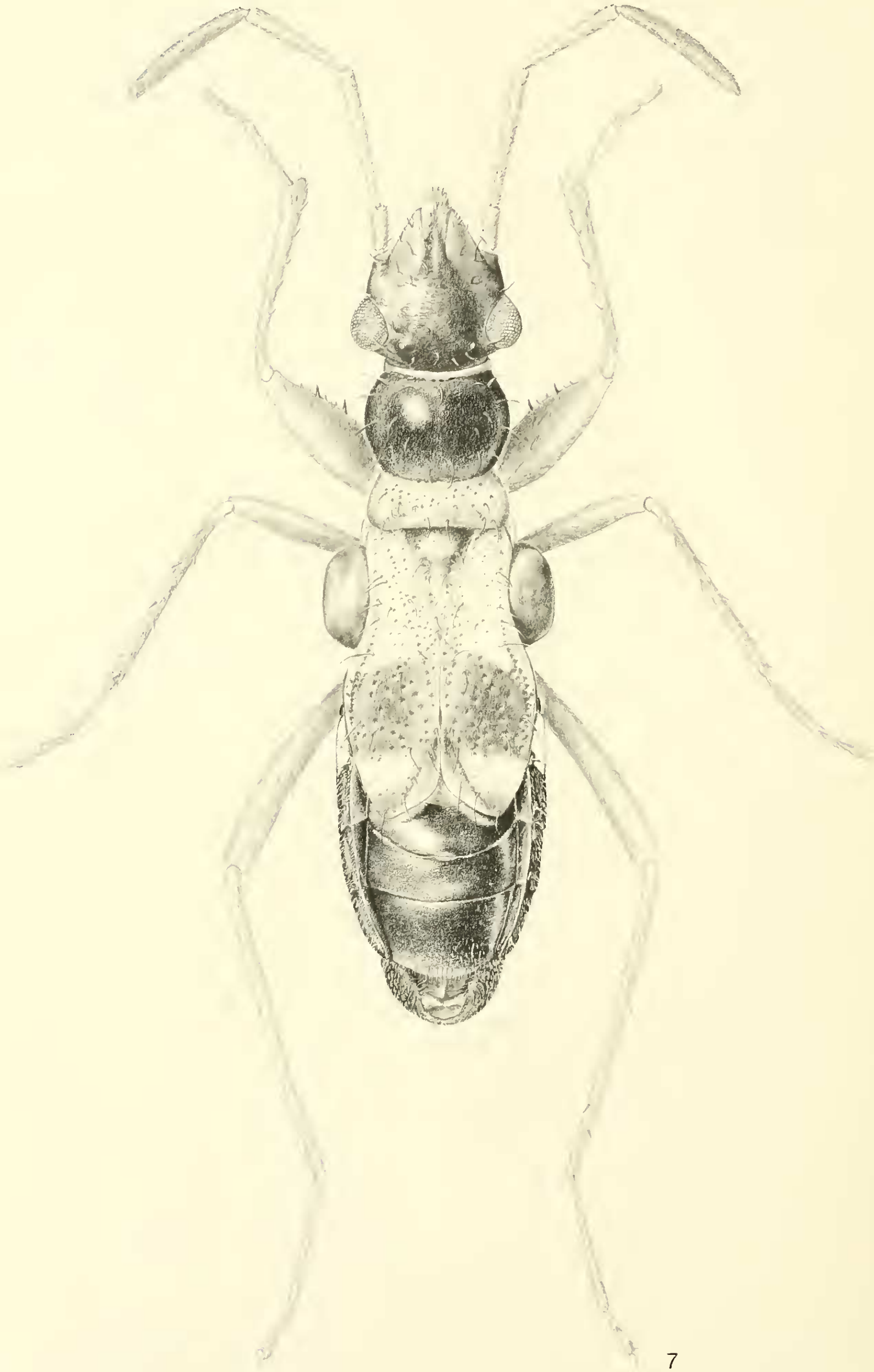
Etymology.—This striking ant mimic is named to commemorate the former Chisos Indians, who lived in the mountains of northeastern Mexico and Southwest Texas and who struggled with the Spanish for survival for over 200 years.

Variation.—Several of the paratypes differ strikingly in color, but we have been unable to find reliable structural differences. The female from Lost Mine Peak, one female from the Chisos Mts. Basin, and the male from NE of Sanderson are almost completely red. In these specimens, the posterior pronotal lobe and anterior portion of the hemelytra, while paler than the head, scutellum, and anterior portion of the hemelytra, are much less strongly contrasting than is true of the holotype. All of the paratypes have essentially the same color markings on the hemelytra as does the holotype, except the paratype from New Mexico, which lacks the pale area immediately anterior to the large distal brown patch, possibly because of the very pale color of the anterior part of the hemelytra (Fig. 7). When present, this pale area enhances the disruptive antlike appearance of the body. The specimens from Chisos Mts. Basin have more coarsely punctate pronotal lobes and have the collar concolorous with the rest of the anterior pronotal lobe. While the male paratype from New Mexico has the metapleuron enormously swollen (Figs. 7, 8), the other specimens also have the area noticeably tumidly produced, more so in males than in females.

All of the paratypes have exactly the same degree and conformation of the wing brachyptery as does the holotype. All agree in having the lateral areas of the abdominal sternum posterior to the band of silvery hairs nearly glabrous and strongly shining.

Diagnosis.—The genital structures described above readily separate this species from *S. insignis,* which also usually has pale legs. The clasper of *S. chisos* (Fig. 2) is stout with a simple short hook, while the clasper of *S. insignis* (Fig. 1) is larger and more complexly lobed. The pattern of conjunctival spines is quite different in the two species. *S. insignis* (Figs. 3, 5) has two ventral distal spines and many small dorsal spines, whereas *S. chisos* (Figs. 4, 6) has distal rows of three and four ventral spines and few dorsal spines. The phallobase of *S. insignis* has large dorsolateral humps. The ejaculatory pump (Fig. 6) and the ventral surface of the pump are covered with small spines in *S. insignis.* The parandria of the male capsule are truncate in *S. insignis* and broadly triangular in *S. chisos.*

Ecology.—The localities in the Chisos Mountains of the Big Bend National Park are both in the Upper Sonoran Pinyon-Juniper-Oak Zone, one on Lost Mine Peak and the other at 6000 ft. elevation above the Basin at Juniper Flats. The Lost Mine Peak specimen was found next to a grass clump (*Schizachyrium scoparium* [Michx.] Nash) on an open dry rock ledge among pinyon pines. The Juniper Flats area was a gently sloping open gravelly biotope surrounded by pinyon pine woodland. The insects (adults and nymphs) were found running rapidly among small stones and sparse grasses (mostly *Bouteloua* spp.). The insects were very effective ant mimics in both movements and appearance and were dif-



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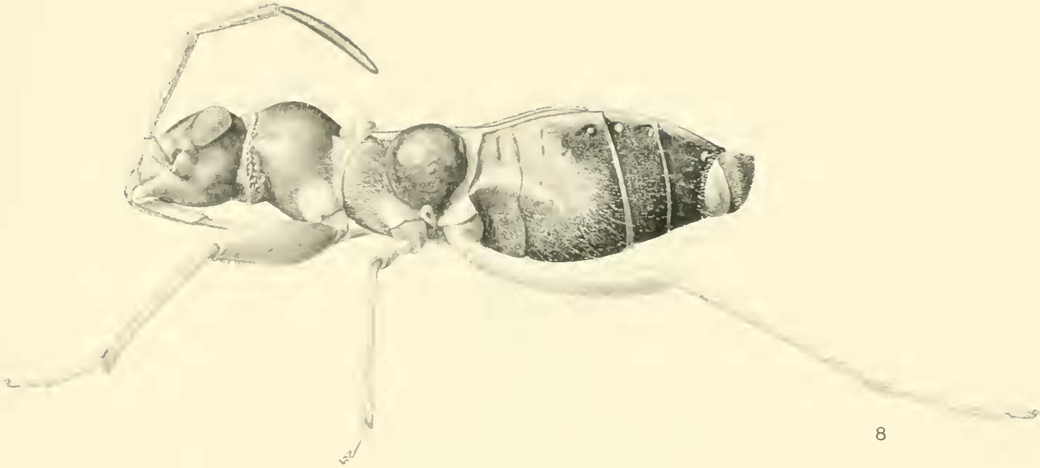
Figs. 7, 8. *Slaterobius chisos* Slater and Sweet, n. sp., paratype male. 7, dorsal view. 8, lateral view.



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ficult to distinguish from the ants present in the same biotope. The only other lygaeids found in these areas were ubiquitous species of *Geocoris* and *Nysius.*

In the Lower Sonoran Zone of desert scrub and desert grassland of the surrounding Chihuahuan desert no *Slaterobius* were found although other long-legged myrmecomorphic Myodochini were present [*Ligyrocoris setosus* (Stål), *Pseudopamera aurivilliana* Distant, *P. nitidicollis* (Stål), and *P. nitidula* (Uhler)], which were not found in the Upper Sonoran Zone. This is similar to the ecological pattern of *Slaterobius insignis,* which in Colorado and New Mexico similarly occurs in Upper Sonoran to Transition Zone altitudes and is replaced by other myodochines in Lower Sonoran desert biotopes.

The distribution, together with the ecological information, suggests that *S. chisos* is probably widespread through the northern Sierra Madre de Orientale where it ecologically replaces the more northern and widespread *S. insignis.* It is thus intriguing that a single specimen of *S. insignis* was collected in the basin of the Chisos Mountains, Big Bend National Park, Texas, in a roadside habitat in the transition from Upper to Lower Sonoran Zones.

We venture to suggest that local populations of these flightless ant mimics would tend to become genetically isolated and would be excellent subjects for detailed population analyses.

### *Slaterobius nigritus* Slater and Brailovsky, New Species
Fig. 9

Very similar to *S. chisos* in general habitus and overall color pattern. Lateral area of abdominal sterna posterior to the diagonal silvery bar thickly clothed with decumbent hairs, as heavily clothed as along meson, thus no large glabrous area present. Legs and antennae completely black or dark-chocolate brown, except paler proximally on middle and hind femora and adjacent coxae. Head and pronotum nearly unicolorous dark-chocolate brown with pronotal calli area differentiated and nearly black. Length of head 1.00, width 0.96, interocular space 0.56. Length of pronotum 1.02, width 0.82. Length of anterior pronotal lobe 0.66, width 0.80. Length of scutellum 0.66, width 0.40. Length of claval commissure 0.50. Midline distance from apex of clavus to apex of corium 0.60. Length of corium 1.76. Length of labial segments I 0.50, II 0.50, III 0.32,

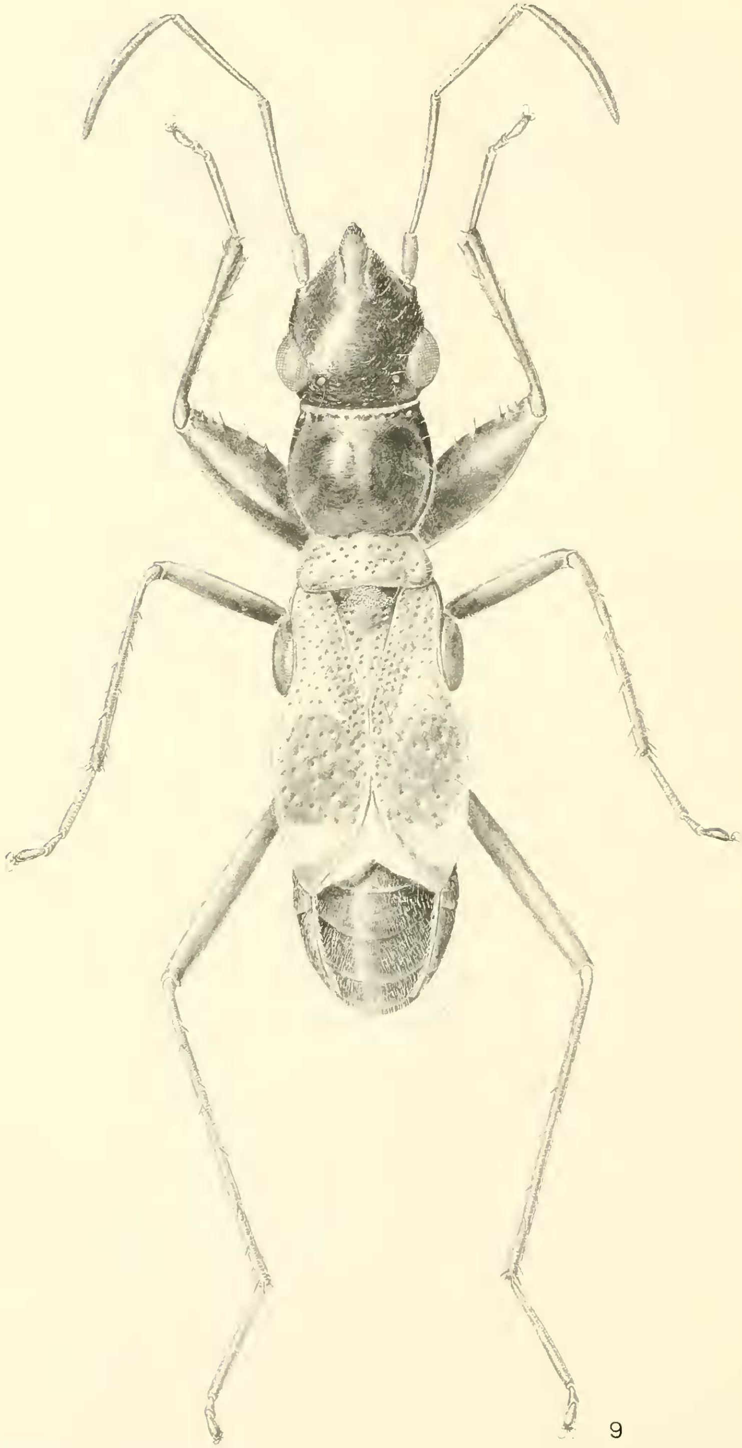

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Fig. 9. *Slaterobius nigritus* Slater and Brailovsky, n. sp., holotype male, dorsal view.

IV 0.32. Length of antennal segments I 0.30, II 0.80, III 0.70, IV—missing. Total body length 4.68.

Type specimen.—Holotype ♂: MEXICO: TAMAULIPAS: Ciudad Victoria, E. Barrera. In Instituto de Biologia, UNAM, Mexico.

Etymology.—The specific name *nigritus* refers to the dark coloration of this species.

Diagnosis.—This species is very closely related to *S. chisos.* It is a more elongate species (Fig. 9) with the median length of the pronotum greater than the width of the head across the eyes. In *S. chisos* the head width is greater than the pronotal length. The pubescence on the abdomen is very different in the two species. In fact, the abdominal pubescence of *S. nigritus* is similar to that found in *S. insignis.*

### *Slaterobius insignis* (Uhler)

As noted by Sweet (1964), this species is dimorphic in color with orange red and black morphs occurring together unrelated to sex or wing condition. They thus may resemble either red or black ants. Our Mexican specimens are all of the pale morph. All nymphs are reddish except for the yellow first instar.

*Fifth-instar nymph* (Fig. 10): COLORADO: Weld Co., Pawnee National Grassland, 17.5 miles N. Hunn Hq., 8–9.VIII. 1973, J. Slater, R. Baranowski.

General coloration bright red brown. Head and anterior pronotal lobe darker brown, contrasting with yellowish tan of posterior pronotal lobe and explanate lateral pronotal margins. Central scutellar area, suffused areas on wing pads and extreme outer edges of explanate wing pad margins dark brown. Y-suture between abdominal terga 3–4 margined with bright crimson. Areas around abdominal scent gland openings between abdominal terga 3–4, 4–5, and 5–6 quadrate-shaped dark brown, the area surrounding anterior gland opening larger than succeeding ones. A dark mesal spot on terga 7 and broader ones on terga 8 and 9. Abdominal tergum otherwise yellowish but suffused with reddish mesally and with obscure lateral pale maculae. Legs chiefly dull reddish with distal ends of tibiae and second tarsal segments darker. Antennal segments 1, 2 and proximal half of 3 pale yellow, segment 3 distally and all of segment 4 dark reddish brown.

Head large, eyes sessile, set well away from anterolateral pronotal angles. Length of head 0.92, width 1.00, interocular distance 0.72. Pronotum nearly quadrate, only slightly narrowing anteriorly, lateral margins strongly explanate. Length of pronotum 0.84, width 1.12. Length of wing pad 1.24. Length of abdomen 2.28. Fore femora incrassate, each armed below on distal third with a single short spine. Labium attaining anterior margin of metacoxae. Length of labial segments I 0.60, II 0.48, III 0.48, IV 0.36. Length of antennal segments I 0.36, II 0.84, III 0.80, IV 1.08. Total body length 4.40.

The Slater (1964) catalogue lists records of this species from Colorado, Idaho, Illinois, Iowa, Maine, Minnesota, Nebraska, New Hampshire, New York, N. Dakota, S. Dakota, Utah, Alberta, British Columbia, Manitoba, Newfoundland, Ontario, Quebec, and Saskatchewan. Sweet (1964) reported it from Connecticut. We have also examined specimens from Michigan, Wisconsin, Wyoming and Mono Co., California, and one specimen from the Big Bend National Park, Brewster Co., Chisos Mts. Basin, 31 May 1977, M. H. Sweet. The Texas specimen is of the pale morph. As noted, it is intriguing that the two species, *S. insignis* and *S. chisos,* are sympatric in the Chisos Mountains.

Our Mexican locality data are as follows: DURANGO: 14 mi. E Las Boregas, 15.VII. 1952, J. D. Lattin (Slater collection). DURANGO: Los Mimbres, 6.VIII. 1974, E. Barrera and H. Brailovsky (UNAM collection).

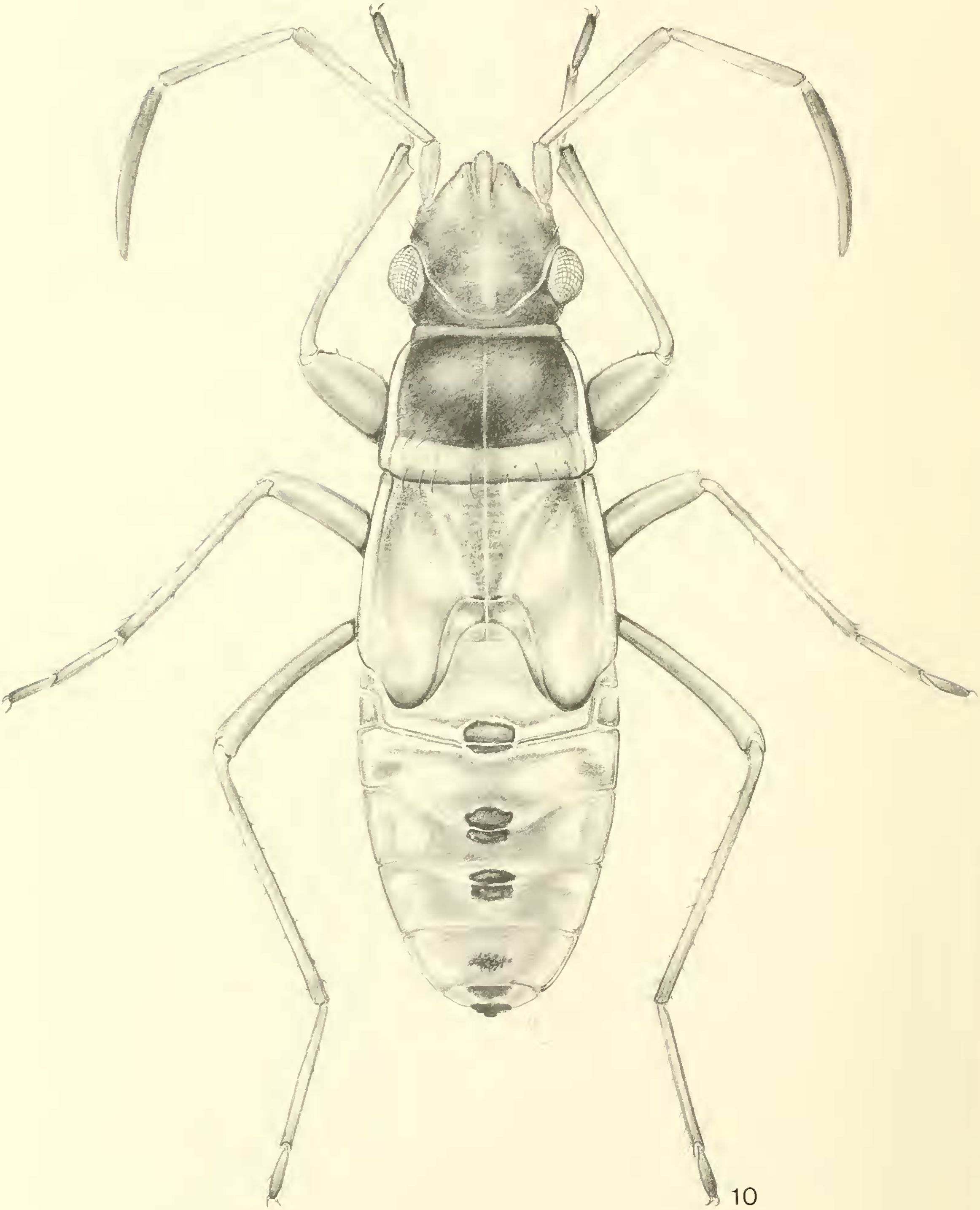

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Fig. 10. *Slaterobius insignis* (Uhler) fifth instar nymph, dorsal view.

## Ecology and Zoogeography

All species of *Slaterobius* are strikingly myrmecomorphic. The biology of *S. insignis* was studied in detail by Sweet (1964). He noted that the species lives on the ground in hot dry habitats where ants are common and that the movements of the lygaeids greatly enhance the already striking structural mimetic appearance.

Harrington (1980) noted that many specimens with reduced hemelytra also showed a "peculiar distended metapleuron which is very bulbous when viewed from above." Both *S. chisos* (Figs. 7, 8) and *S. nigritus* (Fig. 9) have enormously enlarged anterior metapleura that expand well laterad of the body and wings and enhance the ant mimicry effect. To a lesser extent the expanded metapleura are seen in *S. insignis* and *S. quadristriatus*. What the function of this enlargement may be is unknown, but it is tempting to think that it may be a sound-enhancing area for these stridulating insects or/and an accommodation for especially enlarged scent gland reservoirs.

The distribution of the genus is indeed interesting. The occurrence of two additional species in arid regions of the southwestern U.S. and Mexico strengthens Sweet's (1964) hypothesis that the occurrence of *S. insignis* in northeastern North America is probably due to a range expansion from western North America. Similar to *S. insignis,* both new species live on the ground in dry open natural habitats.

In eastern North America the distribution of *S. insignis* is strictly northern despite its inhabiting hot dry substrates (ground surface temperature reaching 50°C) (Sweet 1964). It barely reaches the highlands of northwestern Connecticut and most eastern records are from northern New York, northern New England and southern Canada. It also occurs in Michigan, Minnesota, Wisconsin, Iowa and Illinois. In the western states it has been reported from Utah, Idaho, Wyoming, the Dakotas, Nebraska, Colorado (see Slater 1964). We have examined material from New Mexico and single specimens from California and Texas. The specimens listed above are the first from Mexico. Such a distribution is unusual, but not unique, in the Lygaeidae. *Kolenetrus plenus* (Distant) appears to have a similar distribution. When the distributions of Mexican Lygaeidae are better known, we anticipate that additional similar distribution patterns will emerge.

It seems most reasonable to hypothesize that *Slaterobius* itself originated in conjunction with the rise of the Madro-Tertiary flora in the rain shadow of the ancestral Sierra Madre de Occidentale (Axelrod 1958). Some members of this flora and its attendant insect fauna spread into the Great Plains. The subsequent spread of *S. insignis* eastward may well be associated with morainic dry conditions developing behind the retreat of the ice sheets (Holloway and Bryant 1985, Delacourt and Delacourt 1985, Gaudreau and Webb 1985). Certainly distributions of this kind do not appear to be attributable to the Mid-Holocene eastern extension of the Prairie Peninsula. The preference (Sweet 1964) of *S. insignis* for the seeds of the grass *Schizachyrium scoparium* (Michx.) Nash, a species of dry open areas, gives additional support to the above hypothesis.

It is unfortunate that so little is known of the distribution of *Slaterobius quadristriatus*. Until recently, this insect was known only from the Pine Barrens of New Jersey (Barber 1911). Blatchley (1926) noted that it was "Beaten from small pines, which were partly scorched from fire." *Slaterobius quadristriatus* appears to be an arboreal species, unlike the other known members of the genus and most Rhyparochrominae. Wheeler (1991), in correcting an erroneous reference to *E. depressus* Barber (Slater and Baranowski 1990), reported collecting "numbers of specimens by beating pine cones in New Jersey." Dr. Wheeler (in litt.) and Dr. Harrington (pers. comm.) informed us that Mr. Jonathan F. Fetter first discovered *S. quadristriatus* in Wisconsin on *P. banksiana* Lamb., feeding on pine seeds in the cones. Fetter thus suggested to Wheeler that he search on Pitch Pine (*P. rigida* Mill.) for *S. quadristriatus.* Wheeler (in litt.) was able to find *S. quadristriatus* in New Jersey but noted that he could locate only one colony, despite his extensive collecting on *P. rigida* throughout its range from Maine to North Carolina in the course of his study of the insect fauna of *P. rigida.* Wheeler and Henry (pers. comm.) were also able to find *P. quadristriatus* on jack pine on the Upper Peninsula of Michigan. Wheeler and Harrington both describe the collecting sites as being open pine barren habitats with sandy soil in which the pine trees were short and broad in sparse stands rather than tall and polelike in dense stands.

A further important point is that the pines from which *S. quadristriatus* was collected (*P. rigida* in New Jersey and *P. banksiana* in Michigan) are both species which retain their cones on the trees for years after maturity and the cones are frequently serotinous, staying closed for years and opening irregularly, often when scorched by fire (Fowells 1965). This may promote the arboreal niche of *S. quadristriatus* by extending seed retention and providing cover for this insect. Unlike other arboreal pine seed-feeding lygaeids, such as *Gastrodes* spp., *Orsillus* spp., and *Eremocoris depressus* Barber, *S. quadristriatus* is not flattened to fit inside cone scales. This perhaps indicates a relatively recent niche shift by *S. quadristriatus* to an arboreal habit, given that the other *Slaterobius* species are ground-living. In this context, the absence of the Holarctic genus *Gastrodes* from the eastern United States is noteworthy, given the presence of 4 of its 9 species in the western United States. (*G. walleyi* Usinger is known from one specimen collected in Quebec.) Similarly, while the other species of Nearctic *Eremocoris* are all ground-living, and most feed on conifer seeds (Sweet 1964, 1977, Sweet unpublished), the eastern *E. depressus* is the only arboreal species (Barber 1928, Slater and Baranowski 1990, Wheeler 1991, pers. comm.).

Harrington and Fetter (pers. comm.) have studied the distribution and life cycle of *P. quadristriatus* in Wisconsin, and found it to be a scarce species on jack pine much as Wheeler (pers. comm.) noted for the insect in Michigan and on pitch pine in the East. To stress its arboreal habit, Harrington further noted that she and Fetter could not find *S. quadristriatus* on the ground, even when the insect was present on the tree above. It may be significant that *P. rigida* and *P. banksiana* are considered to be closely related species within the subgenus *Diploxylon* section *Pinaster* (Fowells 1965), a relationship that may be similarly reflected in a "rare" cerambycid *Xylotrechus schaefferi* Schott which uses cones of these same pine species as hosts (Hoebeke and Huether 1990).

To understand the distribution of *S. quadristriatus,* it is significant that both jack pine and pitch pine thrive in the nutrient-poor sandy soils of barren areas where both species form fire climax communities. During glacial maxima, forests of both jack pine and pitch pine occurred in refugia on the vast coastal plain along the North American Atlantic coast to the east and south of the ice sheet (Delacourt and Delacourt 1985). The biogeographical importance of the glacier together with the dry cold mid-American prairies for geographical isolation is well indicated by the general systematic species separation of the eastern coniferous forest from the western coniferous forest of North America. With the amelioration of climate, the most cool-adapted eastern conifers (*P. banksiana* and *P. resinosa* Ait.) invaded the dry periglacial outwash morainic areas virtually up to the margin of the retreating glaciers, and between 10–8000 B.P., these pines had spread west to occupy the lake areas of Michigan, Wisconsin, and Canada (Holloway and Bryant 1985, Delacourt and Delacourt 1985, Gaudreau and Webb 1985). This pattern may explain well the distribution of *S. quadristriatus.* By the same dry route, utilizing open morainic areas, ground-living cool-adapted western elements, such as *S. insignis,* could move eastward to occupy their present more northern ranges in eastern North America. This cool adaptation of the eastern population, which is shown by its univoltine egg diapause life cycle (Sweet 1964), makes understandable the northern restriction of the distribution of *S. insignis.*

Sweet (1964) noted that 80% of the individuals in the populations of *insignis* that he studied were brachypterous and related this to the relative permanence of the dry morainic habitats preferred by the species in New England. All specimens of the new species described here show a uniform degree of brachyptery, with the membrane reduced to a remnant but with the clavus and corium either not fused, or when fused, the two areas are still distinguishable (Figs. 7, 9). In the Upper Sonoran habitat of *S. chisos,* nearly all the rhyparochromine species are pterygopolymorphic, which attests to the relative permanence of the open woodland to montane grassland biotopes. The open pine barren habitats preferred by *S. quadristriatus* are similarly relatively permanent, compared to the life cycle of the species, allowing the species to persist and evolve pterygopolymorphism. As both Wheeler and Harrington remarked, it is nevertheless astonishing how infrequent *S. quadristriatus* appears to be, as compared to the extent of the apparently favorable habitat. It may be that the human overuse of fire, especially in the last century (Wacker 1979), had greatly attenuated the populations of *S. quadristriatus* because of the insect's relatively poor dispersal abilities. Under normal natural conditions of lower fire frequency, brachyptery may have been advantageous for maintaining populations in open seral stages undergoing succession slowly (Sweet 1964). The "rarity" of the cerambyid *Xylotrechus schaefferi,* noted earlier, may have a similar ecological origin.

Given the above new information, we propose a simple vicariant reconstruction of the phyletic history of *Slaterobius.* After its origin as a Madro-Tertiary event in the western Nearctic, the genus spread east. The Pleistocene cooling and dehydration of the central United States separated the western and eastern populations; the latter evolved into *S. quadristriatus,* which differs uniquely in its apomorphic striped color pattern and in its arboreal habit. The western population differed in having apomorphic upright thick setae and a lateral stripe of silvery hairs on the abdomen, but was plesiomorphic in retaining the ground-living habit. The next vicariant event would have been the separation of eastern populations of the Sierra Madre de Orientale from populations of the Sierra de Occidentale and western North America, the latter of which became the widespread *S. insignis,* the former, the ancestral *chisos* + *nigritus* population. The third vicariant event would have been the separation of the northern populations in the southwest U.S. from the southern populations in the the Sierra de Orientale of Mexico. The former, characterized by an apomorphic glabrous posterior abdomen, became *S. chisos,* and the latter became *S. nigritus.* Finally, cool-adapted northern populations of *S. insignis,* following the dry morainic habitats left by the retreat of the Pleistocene glacier, were able to invade northeastern North America, and are now sympatric with *S. quadristriatus,* which as discussed, had probably invaded the Lake States from the east, following the northward migrating populations of jack pine. This proposed scenerio should be amenable to testing by molecular techniques. Actually, given our relatively poor field collections of these insects, especially in Mexico, the phyletic history of the genus well may be more complex.

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